BACKGROUND PAPER
INITIAL MEETING OF THE
UN COMMITTEE ON THE PEACEFUL
USES OF OUTER SPACE

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ANNEX A

COMMUNICATIONS SATELLITES

TECHNICAL STATUS AND PROSPECTS

1. Communications satellites will offer a means of transoceanic communications which, in addition to providing many more channels for telephony than could be economically provided with cables, will provide channels capable of transmitting television signals. They will reduce our dependence on the radio links which are so appreciably affected in performance by the eleven year solar cycle and by the unpredictable solar storms which occur throughout the cycle. At the present time, while the satellite communications systems is conceded to have a broad area of application, there is not yet technical agreement on the specific techniques which should be used for the establishment of an operational system.

2. There are three major communications satellite systems presently being studies, i.e. those using low or intermediate altitude passive reflectors; those using low or intermediate altitude active repeaters; and those using high altitude, synchronous, active repeaters. Low or intermediate altitude satellites orbit from several thousand miles to as much as twelve thousand miles. High altitude, synchronous satellites are in the 22,300 mile orbital condition in which the satellite apparently remains fixed over a point on the earth's equator. The feasibility of the passive reflector system was demonstrated by the ECHO I experiment. The projects, SCORE and COURIER, have shown that low or intermediate altitude active repeaters are also feasible. The feasibility of the high altitude, synchronous, active repeaters remains to be demonstrated.

3. The schedule of future experiments with all these types of systems is as follows:

a. ECHO II (passive reflector experiment) will be launched sometime during 1962.

b. RELAY (active, low altitude experiment) will be launched in the fall of 1962 with a follow-up launching in 1963.

c. TELSTAR (also an active, low altitude experiment) will be launched in the spring of 1962 with a follow-up launching in the fall. This experiment is being paid for by the AT&T Corporation; it will be launched by NASA.

d. SYNCOM (active, high altitude, synchronous experiment) will be launched early in 1963 with a follow-up launching later in the same year.

e. REBOUND (an experiment in multiple launching of passive, low altitude systems) launchings will take place during 1963 and 1964.

4. The TELSTAR and RELAY experiments will involve the use of ground stations in the U.K. France, Germany and Brazil; these stations to be constructed and operated by the host countries under cooperative arrangements which have already been agreed. Possibilities for participation by other countries in later experiments are being actively explored.

5. The objective of these experiments is the establishment of an operational system at the earliest possible time. Such a system will, of course, come into existence as a result of the demand for the services which it can supply. If the early research and development flights on the low altitude active satellites, RELAY and TELSTAR, are sufficiently promising, it may be decided to establish a first system based on low altitude, active satellites. Although it is expected that a brief trans-Atlantic relay of a television broadcast will be possible during the TELSTAR or RELAY experiments later this year, the earliest date one might expect a world-wide communications satellite system capable of routine point-to-point relay of television traffic appears now to be 1967. The date for an operational system of synchronous satellites capable of broadcasting a television signal which could be picked up by present, standard home-type receivers using roof antennas as now commonly employed is much farther off; probably no earlier than 1972.

ARRANGEMENTS FOR A WORLD-WIDE OPERATIONAL SYSTEM

6. The work to date in this field has been entirely experimental, and no determination of responsibility to select, develop, own and operate an operational system has as yet been made. The Congress is in this Session considering a number of bills for the creation of a private corporation or government

authority which would undertake these responsibilities. Such legislation is expected to expedite the research and development effort necessary for decisions as to design of a global communications satellite system and to establish a private company or government authority as the owner of the U.S. portion of a global system which it is hoped will provide efficient communications services throughout the world as soon as technically feasible.

7. The next step, starting early next year, is expected to be the negotiation of international arrangements which will provide for broader ownership and participation. In view of the active interest of foreign countries in establishing communications via satellite and their natural desire to operate their own ground stations as well as participate in the ownership of a global system, the establishment of arrangements for truly international participation would appear to be necessary. If we are to secure general support for the allocation of frequencies for a satellite system, it will be important for other states to feel that they will share in and benefit from the establishment of such a system. Preliminary views on frequency allocation proposals, prepared by United States experts last year, have already been circulated to all of the 115 members and associate members of the ITU.